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ABSTRACT

Contextual teaching and learning (CTL), which is still being designed and implemented, is a conception of teaching and learning that helps teachers relate subject matter content to real-world situation, and motivates students to make connections between knowledge and its applications to their lives as family members, citizens, and workers. Educational theories and themes that relate to CTL include knowledge-based constructivism, effort-based learning and incremental theory of intelligence, socialization, situated learning, and distributed learning. Approaches for implementing CTL include problem-based learning, cooperative learning, project-based learning, service learning, and work-based learning. CTL requires that teachers plan lessons that are developmentally appropriate for students; include interdependent learning groups; provide for an environment that supports self-regulated learning; consider the diversity of students; addresses the multiple intelligences of students (including questioning techniques that enhance student learning and problem-solving skills); and include authentic assessment. In implementing CTL, teachers serve as facilitators, organizers, role models, learning mentors, content specialists, and knowledge dispensers. CTL increasingly is becoming a part of reforms of both career and technical education and academic education. (This document includes a description of an example high school course CTL project that integrates English, mathematics, and career and technical education, and a list of seven inservice professional development projects. (Contains 31 references.) (KC)

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Contextual Teaching and Learning: Preparing Students for the New Economy

by Robert G. Berns and Patricia M. Erickson

A national conversation has emerged in recent years regarding the best way of teaching to attain higher student achievement. Since the hallmark report ***A Nation at Risk*** (National Commission on Excellence in Education 1983), calls for school reform to produce more effective schools as measured by the achievement of *all* students have inundated the country. This focus on student achievement, often measured by standardized tests in such academic areas as reading, mathematics, and science, has challenged career and technical educators. At the same time, the global economy and competitive marketplace, the changing nature of jobs, and advancing technology have influenced career and technical education (CTE) curriculum. In addition, changes in the demographic characteristics of students and the growing body of knowledge about how people learn and what makes for effective teaching have caused career and technical educators to reexamine the basic principles and methodology of career and technical education.

From Behaviorism to Constructivism and Contextual Teaching and Learning

The early 20th-century roots of career and technical education can be found in the theories proposed by David Snedden and Charles Prosser, who suggested that the public schools were an arm of the social system of our society and, thereby, had an inherent mission to further the good of society by contributing to its social efficiency. Then called vocational education, CTE offered a means of preparing well-trained, compliant workers for that efficient society. At the same time, an emerging teaching and learning theory, *behaviorism*, was proposed in which E. L. Thorndike suggested that learning resulted from links formed between stimuli and responses through the application of rewards. Schools would teach students the right work and moral habits. Behaviorism has served as the basic teaching and learning model for CTE (Doolittle and Camp 1999). It continues to be seen in performance objectives, criterion-referenced measures, task lists as a source of curriculum, and specific, predetermined skills demonstrated to industry standards.

Another theory developed at about the same time (1910-1920) was *constructivism*. In this teaching and learning model, students construct their own knowledge by testing ideas based on prior knowledge and experience, applying these ideas to a new situation, and integrating the new knowledge gained with pre-existing intellectual constructs. Rooted in the theories of John Dewey (1900), constructivism calls for active participation in problem solving and critical thinking regarding an authentic learning activity that students find relevant and engaging (Briner 1999).

Although both theories involve student participation, CTE has not tended to include constructivist approaches to the extent it has embraced behaviorism. More specifically, although Prosser and the field of vocational education embraced the engaging element of constructivism, the nature of the curriculum more appropriately lent itself to the approaches of behaviorism. Through the years, CTE teaching and learning approaches have included both direct instruction (usually individual, drill-and-practice exercises based on behaviorism) and projects (sometimes group activities that may or may not exhibit the characteristics of constructivism). An example of direct instruction is an expert demonstrating to students in a horticulture class how to plant roses, followed by students indivdiually planting their own roses with the instructor monitoring and providing feedback as the students practice. The same class may be planning a service project as members of the FFA student organization, in which they plan to provide gifts for the residents of a local nursing home during a holiday season. Although this project may not exhibit all of the characteristics of constructivism, it would have the potential to do so.

As direct instruction followed by practicing specific skills offers a behavioristic means for teaching and learning, contextual teaching and learning (CTL) provides a constructivist model. For this service project to represent constructivism through CTL, the teaching and learning processes must include the characteristics of CTL. Although direct instruction may be appropriate for helping students reach certain learn-

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ing goals, CTL provides the means for reaching other sets of learning goals that require higher-order thinking skills.

Definition of CTL

The contextual teaching and learning initiative is a work in progress. University faculty, in collaboration with P-12 educators, are involved in a variety of projects to study the teaching and learning process. In addition, they continue to research ways to organize the many bodies of knowledge that address various aspects of teaching and learning.

The first of eight recent projects sponsored by the Office of Vocational and Adult Education, U.S. Department of Education was conducted at The Ohio State University in partnership with Bowling Green State University. A preliminary definition of CTL emerged from that study (*Contextual Teaching and Learning* 2000):

> *Contextual teaching and learning* is a conception of teaching and learning that helps teachers relate subject matter content to real world situations; and motivates students to make connections between knowledge and its applications to their lives as family members, citizens, and workers and engage in the hard work that learning requires.

Thus, CTL helps students connect the content they are learning to the life contexts in which that content could be used. Students then find meaning in the learning process. As they strive to attain learning goals, they draw upon their previous experiences and build upon existing knowledge. By learning subjects in an integrated, multidisciplinary manner and in appropriate contexts, they are able to use the acquired knowledge and skills in applicable contexts (Berns and Erickson 2001).

Underlying Support for CTL

For CTL to be considered a legitimate pedagogy to be applied with students, it must be based on sound educational principles, theories, and practices. CTL builds upon bodies of literature that include theories and writings by Dewey (1900), Piaget (1929), Bruner (1966), and others. Thus, it is an extension of past thinking, theories, testing, and writings. More contemporary work has included syntheses by Resnick and Hall (1998) and themes identified by Borko and Putnam (1998). Examples of theories and themes that relate to CTL follow:

Knowledge-based constructivism—Both direct instruction and constructivist activities can be compatible and effective in the achievement of learning goals (Resnick and Hall 1998).

Effort-based learning/incremental theory of intelligence—Increasing one's efforts results in more ability. This theory opposes the notion that one's aptitude is unchangeable. Striving for learning goals motivates an individual to be engaged in activities with a commitment to learning (ibid.).

Socialization—Children learn the standards, values, and knowledge of society by raising questions and accepting challenges to find solutions that are not immediately apparent, along with explaining concepts, justifying their reasoning, and seeking information (ibid.). Indeed, learning is a social process, requiring social and cultural factors to be considered during instructional planning. This social nature of learning also drives the determination of the learning goals (Borko and Putnam 1998).

Situated learning—Knowledge and learning are situated in particular physical and social contexts. A range of settings may be used such as the home, the community, and the workplace, depending on the purpose of instruction and the intended learning goals (ibid.).

Distributed learning—Knowledge may be viewed as distributed or stretched over (Lave 1988) the individual, other persons, and various artifacts such as physical and symbolic tools (Salomon 1993) and not solely as a property of individuals. Thus, people, as an integral part of the learning process, must share knowledge and tasks (Borko and Putnam 1998).

Working together, these theories and others serve as underlying principles upon which the CTL conception and process is based. Indeed, "the contextual approach recognizes that learning is a complex and multifaceted process that goes far beyond drill-oriented, stimulus-and-response methodologies" (Center for Occupational Research and Development 2000, online, n.p.).

Characteristics of Contextual Teaching and Learning

CTL can be more fully described by identifying its characteristics. These attributes include its interdisciplinary and contextual nature, approaches that can be used to implement it, factors that address individual needs of students, and the teacher's role.

Interdisciplinary Learning, Problem-based Learning, and External Contexts for Learning

For instructional processes to be CTL, learning must be extended across disciplines so that students gain a real-life perspective. They see how the knowledge and skills relate to their lives either now or in the future. Real-world situations and problems rarely represent only one discipline.

The intent is also for the level of learning to rise so the students can better understand life situations (e.g., those presented at the workplace), identify and effectively solve problems, make wise decisions, and think creatively. Thus, if students are engaged in a classroom research project in which they are studying city plans to change a natural preserve to a housing development near the school, they would need to be learning and applying language arts, mathematics, and scientific knowledge while addressing the agricultural issues inherent in such a situation. Whether the agriculture teacher is the only instructor involved, or a team of teachers from the academics and CTE subject areas are collaborating, the learning goals would transcend one specific discipline.

The learning goals may be based on (1) state, local, and/or professional association content standards from the involved disciplines; (2) such skills as the Secretary's Commission on Achieving Necessary Skills (SCANS 1991), WorkKeys® (ACT 2001), and other family, employability, and process competencies; and (3) higher-order thinking skills such as problem solving, critical thinking, and decision making.

In CTL, experiences help students make connections with both internal and external contexts. They begin with their existing knowledge, past experiences, and other current classes or situations (Berns and Erickson 2001) and conduct activities in such external contexts as the school, home, workplace, and the Internet. These experiences result in a deeper understanding so that students are more likely to retain competencies for a longer period of time and be able to apply them in appropriate ways at appropriate times in the future.

Thus, the integration of academic and career-technical education helps the student understand the content of both the academic subject matter and the subject matter of the career and technical area of study. All teachers, individually or in teams of career-technical and academic teachers, can use CTL to increase student learning and achievement in such integration efforts, thus resulting in better meeting the purposes, goals, and objectives of specific schools, classes, and education in general.

Approaches for Implementing CTL

To implement CTL, a variety of teaching approaches may be used. Over the years, five teaching approaches have emerged that include context as a critical component. They engage students in an *active* learning process. These approaches are not discrete. They can be used individually or in conjunction with one or more of the others. Although varying in the literature, the following definitions are intended to capture the essence of the concepts as means for implementing CTL:

Problem-based learning—an approach that engages learners in problem-solving investigations that integrate skills and concepts from many content areas. This approach includes gathering information around a question, synthesizing it, and presenting findings to others (Moffitt 2001).

Cooperative learning—an approach that organizes instruction using small learning groups in which students work together to achieve learning goals (Holubec 2001).

Project-based learning—an approach that focuses on the central concepts and principles of a discipline, involves students in problem-solving investigations and other meaningful tasks, allows students to work autonomously to construct their own learning, and culminates in realistic products (Buck Institute for Education 2001).

Service learning—an approach that provides a practical application of newly acquired (or developing) knowledge and skills to needs in the community through projects and activities (McPherson 2001).

Work-based learning—an approach in which workplace, or workplace-like, activities are integrated with classroom content for the benefit of students and often businesses (Smith 2001).

Many CTE instructional models provide a format to allow for these CTL approaches: cooperative education, work experience programs, internships (paid and unpaid), apprenticeships, in-school laboratories, simulations, and school-based enterprises. However, these models do not automatically use the CTL process. To do so, the teachers need to include the characteristics of CTL identified in this section.

Activities and projects sponsored by career-technical student organizations may also include various attributes of CTL. For example, if the FFA service project for a nursing home cited earlier were to be based on the problem-based learning approach, the students would have identified the specific project after being presented with a "fuzzy" situation, such as "a nursing home in town might have some needs." The students would then spend time in the nursing home. They might find that the residents' rooms are not very colorful. They would then organize themselves into small groups and work on solving the problem. In the process, they might write messages to each other, calculate the mathematics to determine the resources needed for driving to and from the nursing home, verbally communicate with the school and nursing home administrators, and apply whatever career-technical skills are intended (e.g., the preparation of floral arrangements, if a horticulture class). The students would orient the nursing home administrators and provide a debriefing following the placement of the arrangements in the rooms. The project, then, would be intended to reach specified learning goals from mathematics, language arts, and horticulture as identified in the standards and curriculum.

In this example, various aspects of problem-based learning, project-based learning, and service learning merge into a learning experience for the students. CTL requires these approaches to be used in a more holistic manner than often used in the past. Again, CTE instructors may already use this type of activity in their class or in their CTE student organization; however, how it is done—the amount and nature of the student participation, for example—determines the extent to which the project represents CTL.

Factors that Address Individual Needs of Students

For the instructional process to be considered to be contextual teaching and learning, teachers must address the following factors when using one or more of the CTL approaches (Berns and Erickson 2001). These concepts are based on cognitive research that has provided a rich knowledge base on how people learn. Teachers must—

- plan lessons that are *developmentally appropriate* for the students. The relationship between curriculum content and methods used to teach students must be based on the particular levels of the students' social, emotional, and intellectual development. Thus, the age of the students, other individual characteristics, and their social and cultural environment must be taken into consideration. What a high school senior is ready to learn and do, for instance, may be quite different than a high school sophomore (Kilmer 2001).
- include *interdependent learning groups*. Through small groups, students learn from each other and learn to work in teams, quality circles, and other forms of collaboration that are required of adults in the workplace and in other contexts in which students will be expected to function.
- provide for an environment that supports *self-regulated learning*. Students need to understand their strengths and weaknesses, to set attainable goals, and to develop strategies to achieve their goals. As they learn these skills, they gain self-confidence and competence. They now understand the importance of taking time to think and reflect on options before plunging forward during life's challenges. Through self-regulated learning, teachers also create an environment in which students reflect on how they learn, how they

approach schoolwork, how they could deal with obstacles, and how they could work in harmony with others. With CTL approaches requiring group work, students need to be able to contribute so that their group will be successful (Winograd and Paris 2001).

- include consideration of the *diversity of students*. Teachers must teach to a wide range of students. Considerations include students' racial and ethnic backgrounds, their socioeconomic status, their primary household language, and any disabilities they may have. For example, teachers evaluate materials for sex bias and stereotyping. They also plan and react to language so that students overcome language barriers to learning (Sapon-Shevin 2001).
- address the *multiple intelligences* of students. When using a CTL approach, the ways particular students in the class learn best need to be considered. Gardner (1993) has identified eight learning orientations that involve such factors as hearing or seeing language, involvement, music, numbers, visualization, human movement, interaction with others, and leading. Teachers embed within the CTL approach strategies that make instruction effective for students of varying intelligences (Brockman and Brockman 2001).
- include *questioning* techniques that enhance student learning and the development of problem solving and other higher-order thinking skills. For CTL to achieve its goals, appropriate types and levels of questions must be asked. Questions must be carefully planned to produce the intended level of thinking, responses, and actions by students and all participants in the CTL approach (Frazee 2001).
- include *authentic assessment*. Authentic assessment evaluates a student's application of knowledge and complex thinking, rather than rote recall of factual information. The interdisciplinary nature of CTL requires assessment that measures knowledge and skills in more than one discipline and in multiple ways (Ananda 2001).

The Teacher's Role

For the CTL approaches to be most effective in student learning, teachers must plan, implement, reflect upon, and revise lessons. Such plans are based on CTL principles and approaches that require teachers to serve in the following roles: facilitator, organizer of the teaching/learning/assessment process, role model, learning mentor, content specialist, and knowledge dispenser. Although the teacher can implement CTL individually, teacher collaboration maximizes interdisciplinary learning. For teachers to be effective using CTL, they must be prepared to understand its various aspects. Models for preparing current and future teachers are currently under development through activities funded by the U.S. Department of Education. These projects are described later.

School Reform, Career-Technical Education, and CTL's Role

CTL is an instructional process. As such, it is increasingly being used by schools within their school reform efforts. CTL can serve as the pedagogical component of this reform in all subjects and at all grade levels for all students. It provides a means for teaching to be improved within the varying innovative initiatives designed to produce increased learning by all students.

As part of the reform effort, career and technical education is developing and implementing a variety of models for organizing schools and programs in a way that makes sense to students, brings meaning to the classroom in the form of relationships between subject matter and careers, and elevates the level of learning by all students. Career academies, majors, and pathways as well as tech prep are examples of these models.

At the same time, CTE is increasingly being seen as a means for enhancing academics. By providing a curriculum that is based on the need for students to demonstrate mastery of rigorous industry standards, high academic standards and related general education knowledge, technology, and general employment competencies, CTE provides an avenue for school reform, especially at the high school level.

An intent of all of these concepts is increased student learning. However, the ideas also respond to the needs of a new economy that Lynch (2000) suggests is a major influence on the entire educational system. A new world of fast communication, rapid decision making, international activity, cyberspace, ever-changing market demands and standards, increasingly sophisticated computers, and the need for a more thorough knowledge of the whole business environment (ibid.) characterizes the world for which CTE and, indeed, all of education, is preparing its youth.

Lynch (2000) also cites the following directions of the *new career and technical education* (p. 1):

- Preparing students with the education and technical skills they will need for successful employment in various careers or professions
- Teaching students about all aspects of an industry
- Enhancing academics by bringing real-world context and application—especially targeted to workplaces—to education
- Teaching students how to apply high-level math, science, technology, and language in workplaces and communities
- Preparing high school students for college, should they and their families choose for them to attend
- Preparing students with the academic foundation to be lifelong learners

For the new CTE to be successful, the instructional process must change. In the past, career and technical education created and followed a task-based curriculum. Students were prepared to perform the specific duties required of a job. Although learning skills to perform such tasks may be important in some CTE programs, CTL requires that portion of the curriculum to be placed in a broader framework that integrates other subject content into the learning process for the students. Learning goals are elevated to higher-order thinking skills in the process of learning how to find information, adapt to change, and communicate effectively while relating appropriately to others.

Thus, a more constructivist, CTL approach to teaching and learning is required. Contextual teaching and learning provides a means for developing career-related and academic competencies at a high level. Although CTE was at the forefront of relating subject matter to real world situations, the constructivist approach, as embodied in the various aspects of CTL, has not been the usual instructional process.

An Example

Envision a high school faculty lounge 2 days before the school year is to begin in the fall. One of the career-technical marketing teachers is discussing her junior class with two of her colleagues, a math teacher and an English teacher, who also teach juniors. Concerned about students who often lack interest in academic subjects, they think some sort of cross-course activity might be more motivating. The marketing teacher suggests the three of them collaborate on using contextual teaching and learning, a concept she had learned in a professional development activity last year.

She tells them how problem-based, project-based, and cooperative learning can be used to increase student achievement. Specifically, she suggests they have the students complete a marketing research project. Such a project could be designed for the students to meet two marketing state and local standards (Vocational Instructional Materials Laboratory 1995): (1) use marketing information to make decisions, and (2) conduct marketing research (including develop research materials, collect data, etc.).

Such a project would require students to learn both marketing and academic subject matter in English and mathematics. The following language arts and mathematics standards would apply (VIML 1999):

- Apply measurement and spatial skills
- Apply statistical analysis skills
- Analyze critical data
- Create graphs and charts
- Use spreadsheet software
- Apply listening skills
- Apply technical writing skills

Employability learning standards would also be sought (ibid.):

- Use scheduling techniques
- Use word-processing software
- Contribute to teamwork
- Build interpersonal relationships
- Demonstrate technological literacy
- Apply self-management processes

The academic teachers agree to collaborate with the marketing teacher to provide this engaging, interdisciplinary activity for their students.

It is now early October, and the class is about to begin a unit on marketing research. After having spent a month planning for this project with the other two teachers, the marketing teacher tells her junior class that they will be learning marketing research by conducting a class project. She says that their English and mathematics teachers will be involved along with the local Chamber of Commerce. She has made an appointment with Jim Smith, the director of the Chamber, and would like an officer of the class DECA chapter to accompany her to his office downtown to invite him to their class. A few days later, the DECA president and marketing teacher extend the invitation to Mr. Smith, and he enthusiastically accepts.

The teacher follows up the visit with a phone call to Mr. Smith to discuss the goals of the class and his potential role in the upcoming project. The following week, Mr. Smith visits the class. He tells the students of the community's master economic development plan, which will include the development of housing divisions, business strip centers, and light industry.

Looking at the plan, he asks the students what they see as a need for the community. The teacher then places the students in small groups of four. During the group work, the teacher and Mr. Smith travel from table to table helping the students in the process. A leader from each group then reports the group's ideas to the full class.

One group suggests that entertainment is limited in the community. Although there are typical theatres, restaurants, and shopping areas, they identify a dinner theatre as an attraction that might be popular. The class collectively agrees that this area would be interesting to pursue.

The next questions posed to the students are, How does that type of business fit into the overall economic development plan for the community? What information would be helpful to determine the likelihood for success by such a business? Such questions require students to think at a higher level. They soon discover that some type of marketing research study would help them answer the question.

After full discussion, the class, teacher, and Mr. Smith agree that a survey of the community to determine the level of support for a dinner theatre would be the marketing research project. This pursuit will be authentic in that the results will actually be used in the community. At the conclusion of the project, the final report will be shared with members of the Chamber of Commerce at one of their regular evening meetings. The students are quite enthused at the possibility of their work eventually resulting in an actual new business being opened in the community.

As the project is being identified, the teacher considers the extent to which it would be developmentally appropriate. Since the students are high school juniors, she feels they have the prerequisite skills to complete the project successfully. She decides the project will, indeed, be appropriate while providing experiences that will lead the students to the standards set for the class.

In planning the project so that individual student needs will be met, the teacher considers the diversity of the learners. Realizing that the students need to learn to work effectively in groups consisting of diverse individuals, she carefully places students into groups with the assistance of her English and mathematics colleagues so that the composition includes variance in ability level, communication skills, maturity level, and background. The groups are assigned roles such as *survey instrument*, *data analysis*, *graphs and charts*, *final report*, and *public relations*. The entire class will collect the data in the community.

After the marketing instructor determines that the students undertand the parts of a marketing research project, the class as a whole identifies the specific problem to be addressed (i.e., to determine the level of interest in the community for a dinner theatre) and the method of collecting information. Realizing that any data collection will require financial resources, they consider the needed budget along with the pros and cons of each possible method (e.g., mail survey, telephone survey, individual interviews, and focus group interviews). They choose to prepare a short survey instrument that they will distribute at various business locations in the community.

During the project, the students are encouraged to ask high-level questions while the teacher also asks such questions as, Why do you want to ask that particular question on the survey instrument? How can you ensure that the question you are asking will provide the information you need?

The students are also required to keep individual journals every day for a variety of reasons. First, students increase learning through reflection. Also, teachers can monitor the progress of groups by reading such journals. In the journals, the students address such issues as "my contribution to the group today," "what I learned today, " and "what I need to do differently tomorrow." Reflecting upon their own behavior and learning also provides the students with a means to regulate their own situation.

During the next 2 weeks, the class works in their small groups. They are required to prepare progress reports that are assessed by both the marketing and English teachers. The group that completes the data tabulation and analysis and that prepares the graphs and charts first presents its work to both the marketing and mathematics teachers for their assessment. After the work has been accepted, this group then presents it to the entire class, being careful to explain the mathematical procedures used to arrive at their statistics.

All of the groups collaborate to prepare a final report for the Chamber of Commerce. After several drafts with the help of both the marketing and English teachers, the report is presented at a Chamber meeting. The principal and the English and mathematics teachers accompany the marketing teacher and her students to the meeting. After the presentation, the students receive a warm ovation. In fact, a few days later, the class receives a letter of appreciation from Mr. Smith and the Chamber of Commerce. In it, they explain how the report will be used by the Chamber to encourage targeted community members to consider developing a dinner theatre for the community.

As is evident, the students have been assessed in multiple, authentic ways during the course of the project (formative assessment) and at its conclusion (summative assessment). The rubrics for these assessments were constructed by the students with the help of the teacher. The formative assessments included individual daily journals (assessed by the marketing teacher) and process assessment by students and the marketing teacher (three times)—including such criteria as individual student contributions to the group, verbal communications, interpersonal skills, etc. The summative assessment included a final report (assessed by Mr. Smith and the English, mathematics, and marketing teachers) and the presentation (assessed by Mr. Smith, the principal, and the three teachers).

What was once a unit in which one teacher (the marketing teacher) lectured while the students took notes and later completed a paper-and-pencil test, the instruction has become an interdisciplinary, higher-level, and more real and *meaningful* experience for the class. In preparing students to be successful in the marketing workplace of today and tomorrow, the classroom has now become more like that environment.

Through this project, the students were learning three subjects at the same time in an integrated manner. A team of teachers, along with a businessperson, contributed to the planning and implementation of the project, bringing expertise from a variety of content areas to the learning process. Some of the learning occurred outside the school. The project became more motivational and real to the students, allowing them to learn subject matter at a higher level while helping them develop a variety of "process" or "life" skills, including teamwork, communications, problem solving, and assuming responsibility for their own learning.

The National CTL Initiative

As is evident from this example, CTL implementation requires the teacher to play a significant role. Indeed, studies suggest that "what teachers know and can do is the most important influence on what students learn" (Darling-Hammond 1996, p. 6). Although student characteristics, including socioeconomic status, account for variance in achievement, the teacher's knowledge of the subject matter and skill in the use of decision making, problem solving, creative thinking, instructional planning, implementation of plans, and assessment of situations and students make a definite difference in how much students learn, at what level the students learn, and to what extent they retain that knowledge.

In 1997, the Office of Vocational and Adult Education, U.S. Department of Education, funded a project at the Ohio State University in partnership with Bowling Green State University to define contextual teaching and learning, develop a framework for describing and studying CTL in preservice teacher education, prepare a set of background papers, and identify and study university/college programs that prepare teachers to use various aspects of contextual teaching and learning (*Contextual Teaching and Learning* 2000).

From that work, seven additional projects were funded to create models for the recruitment and preservice preparation of future teachers and development of inservice teachers. These projects are described here (source: U.S. Department of Education 2000). Although most of these models are still under development, contact information is included for readers interested in learning more about them or in identifying products and their availability.

Inservice Professional Development Projects

Bowling Green State University. BGSU has created an interactive, Web-based Model of Excellence for the inservice professional development of P-12 teachers in the effective use of CTL. This distance-learning model allows teachers to learn CTL in a contextual, problem-based, engaging manner. The ultimate goal is to enhance P-12 student learning, resulting in better success in postsecondary education and careers. The system has been piloted in four school districts.

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Johns Hopkins University. Johns Hopkins University is developing, demonstrating, and evaluating an inservice professional development approach and materials for high schools that will support contextual teaching and learning within a Career Academy structure. All of the professional development activities and materials will be demonstrated and evaluated in nonselective urban high schools with Career Academies that blend academic and vocational content in the core curriculum and electives.

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University of Wisconsin at Madison. This project has designed the TeachNET model, which is intended to enhance inservice professional development programs by providing teachers with opportunities to participate in workplace/community learning experiences and assisting them in applying what they learned to instructional practices. TeachNET has established a network of Regional Cluster Teams—each coordinated by a local Professional Development Organization—committed to enhancing local capacity for providing professional development opportunities that connect workplace/community learning and contextual instructional practices. TeachNET is particularly relevant for districts, school partnerships, and consortia of educational institutions in urban and rural settings interested in maximizing participation in workplace learning.

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Website: www.cew.wisc.edu/teachnet

Preservice Preparation Projects

The Ohio State University. This project is designed to complete a cross-program analysis of the profiles of five university preservice teacher preparation programs that exhibit characteristics of CTL. A comprehensive model program of contextual teaching and learning preservice teacher education is under development with plans for the Urban Network to Improve Teacher Education (UNITE) to review and refine the model program. A program inventory will assess the degree to which selected UNITE partners are using contextual teaching and learning in their programs. Technical assistance will support the implementation of the contextual teaching and learning framework at The Ohio State University, George Washington University, and Western Oregon University.

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University of Georgia. The overall goal of the UGA project is to develop and implement a preservice teacher education model that is based in a theoretical framework of contextual teaching and learning. The model will permit preservice teacher education students to move through courses that integrate contextual teaching and learning concepts. It also will use a broad range of contexts both to inform teaching and learning and to provide places for them to occur beyond the classroom. Preservice students will experience CTL in diverse settings and will reflect upon and integrate their experiential learning into contextual curriculum and pedagogy that can be used in their teaching.

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Washington State Contextual Education Consortium. Led by the University of Washington, the Washington State Contextual Education Consortium is a partnership of 10 universities and colleges that are collaborating with 18 demographically diverse school districts to enhance attention to contextual teaching and learning in preservice teacher preparation programs across the state. The project includes the development of statewide Contextual Education Academy designed to engage professors of education and arts and sciences with K-12 teachers in demonstrating innovative contextual teaching and learning classroom strategies that effectively address new state academic standards, providing technical assistance to the practitioners faculty, replicating local variations of the academy model in the areas of the state represented by academy members, developing a compendium of effective contextual teaching and learning materials, and developing a compendium of effective preservice teacher preparation models.

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Recruiting New Teachers, Inc. The Urban Teacher Academy Project (UTAP) being conducted by Recruiting New Teachers promotes a highly qualified and diverse teacher work force for the nation's urban schools by expanding on the successful school-to-career approach of teacher academies. These teacher academies encourage high-school students to consider careers in teaching through a specialized 2- to 4-year curriculum related to teaching and learning, practice-teaching opportunities in local schools under the guidance of mentor teachers, and help in pursuing postsecondary education. Many teacher academies operate in partnership with community college and/or university education programs, thus giving students a supportive corridor into the teaching profession.

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In summary, contextual teaching and learning draws upon the latest research on effective teaching and student learning. As a pedagogical aspect of school reform, it places responsibility on the student with the teacher serving as a significant contributor in the process. Engaging, active learning replaces passive, traditional methods through a variety of hands-on, collaborative, high-level approaches. These approaches result in a motivational, invigorating educational experience for all students as they learn at a higher level. As a result of CTL, students are better prepared for the new economy. They better retain knowledge and skills, thus raising student academic and career-technical achievement. Indeed, they are better prepared for postsecondary education, careers, and bright futures in the 21st century.

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A list of website addresses for each of the CTL teaching approaches and other CTL concepts is available at http://www.bgsu.edu/ctl. A CTL reference book list is available at http://nccte.com/publications/infosynthesis/index.html

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